

Implementing a Spatial Decision Support System for Puerto Rico: The Political Process

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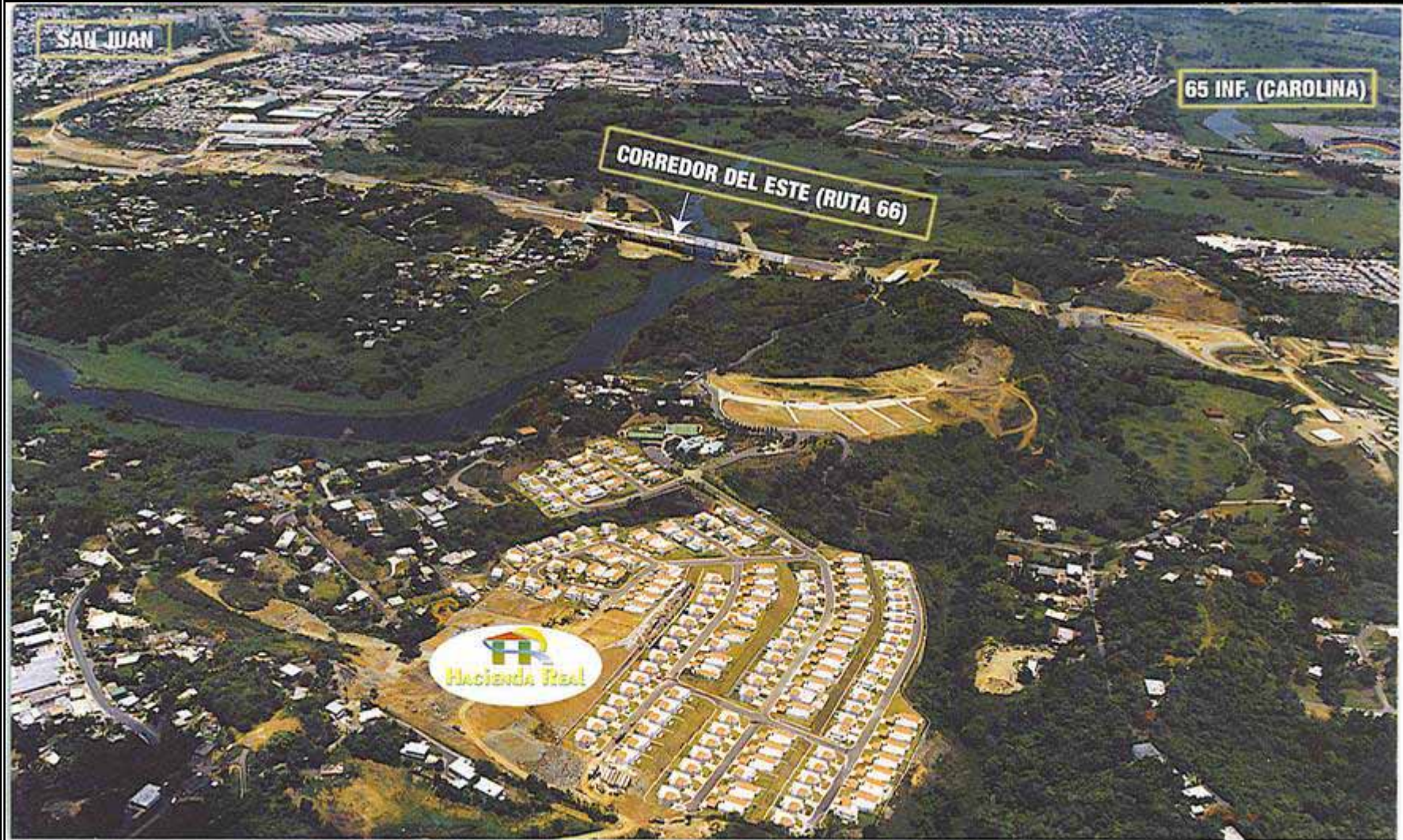
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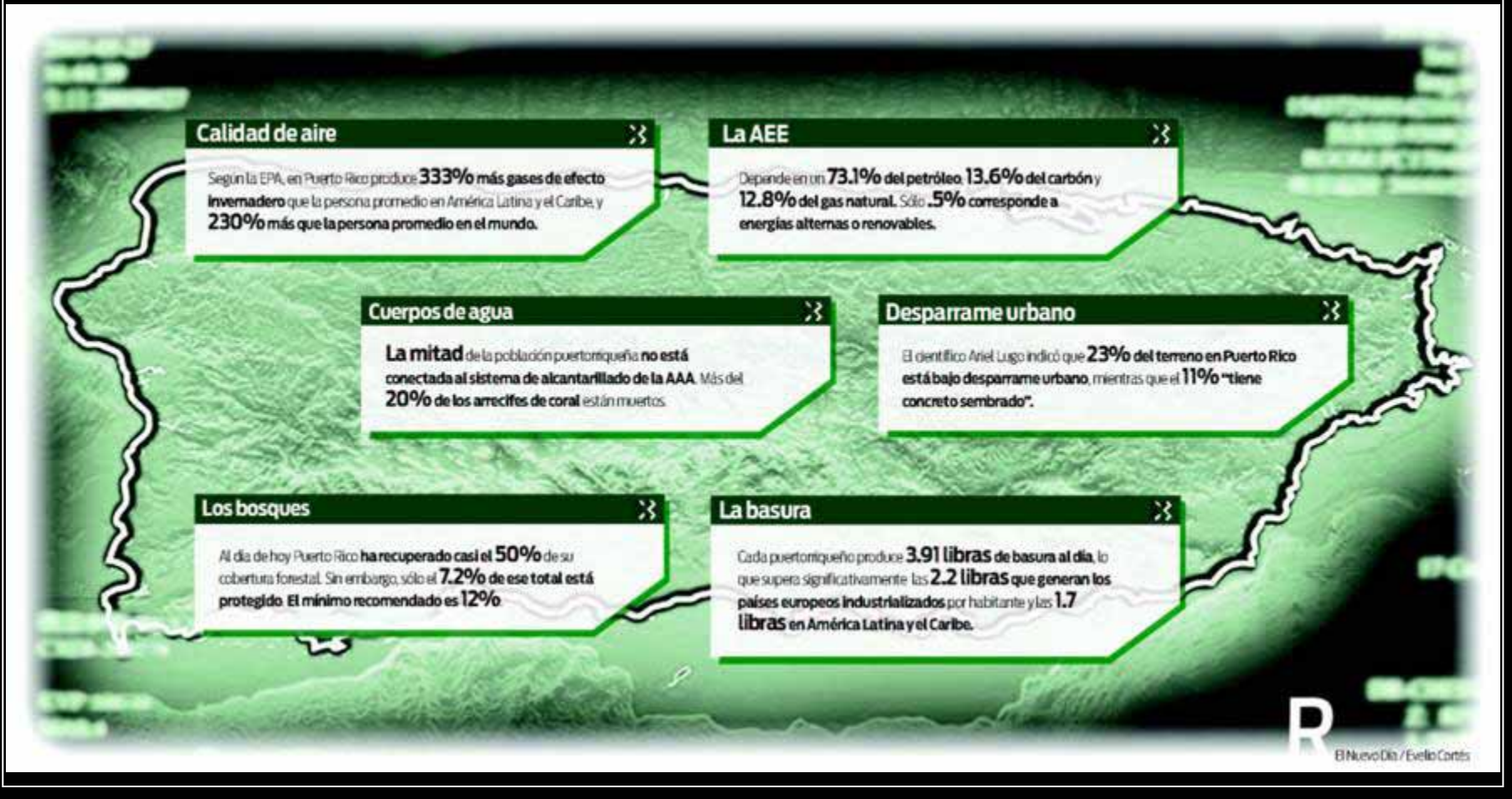
Puerto Rico: Some Key Facts

- Puerto Rico is a densely populated Caribbean archipelago that transformed itself in 50 years from a very poor rural to an industrial urbanized society.
- Industrialization was a relatively successful strategy to lift the island from poverty.
- Urbanization and land use has been a planning failure.

Puerto Rico's Dominant Land Use Pattern



Indicators of Environmental Stress



What is Xplorah

- A state of the arts SDSS tailor-made for the Integrated Assessment of Socio-economic and Environmental Spatial Policies.
- With simulation capabilities that produce future likely land-use patterns consistent with user-defined scenarios developing into the future.
- A tool to support strategic thinking and evaluation of alternative policies under different sets of circumstances.

Objectives and State of the Art

- Xplorah was planned to evolve into a SDSS for the Integrated Assessment of Socio-economic and Environmental Spatial Policies:
 - Autonomous developments (dynamics) of the system;
 - Current and future effects of policies;
 - Evaluation of alternative policies.

The Development Process

- The GSP commissioned the development of Xplorah to RIKS in 2001 with support from:
 - The Office of the President of the University of Puerto Rico; and
 - Public Policy Research Center of the Rafael Hernández Colón Foundation (RHCF);
- First prototype available March 2002;

Xplorah's *Building Blocks*

- The core element is the *Constrained Cellular Automata* model of White, Engelen and Uljee, representing the Puerto Rican archipelago at 4 geographical levels:
 - 3 Islands
 - 78 Municipios
 - 100 Transport Zones and
 - 225,000 Cellular Entities of 6.25ha each.
- Demographic and economic systems integrated by means of linked dynamic models that jointly determine land use patterns over time.

Resistance met:

- Development and implementation of the Xplorah SDSS met resistance at the institutional level reflecting:
- The political nature of land use policies.
- The very limited role traditionally played by sophisticated tools for policy making and planning.

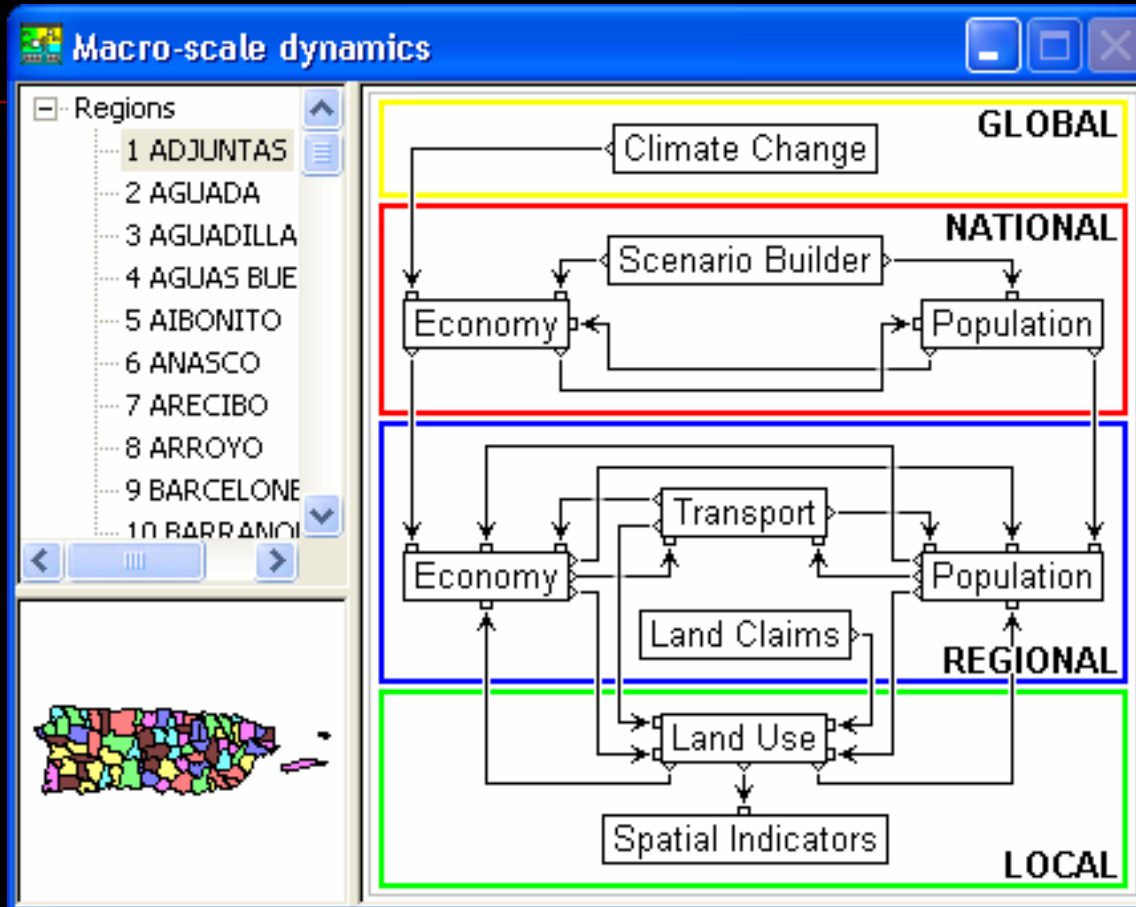
Strategy Followed to Gain Support From Potential Users

- Integrate existing models being used in uncoupled and unrelated modes, with new models of special interest:
 - Demographic
 - Input-output
 - Macroeconomic and sector
 - Housing supply / demand
 - Transportation
 - Climate

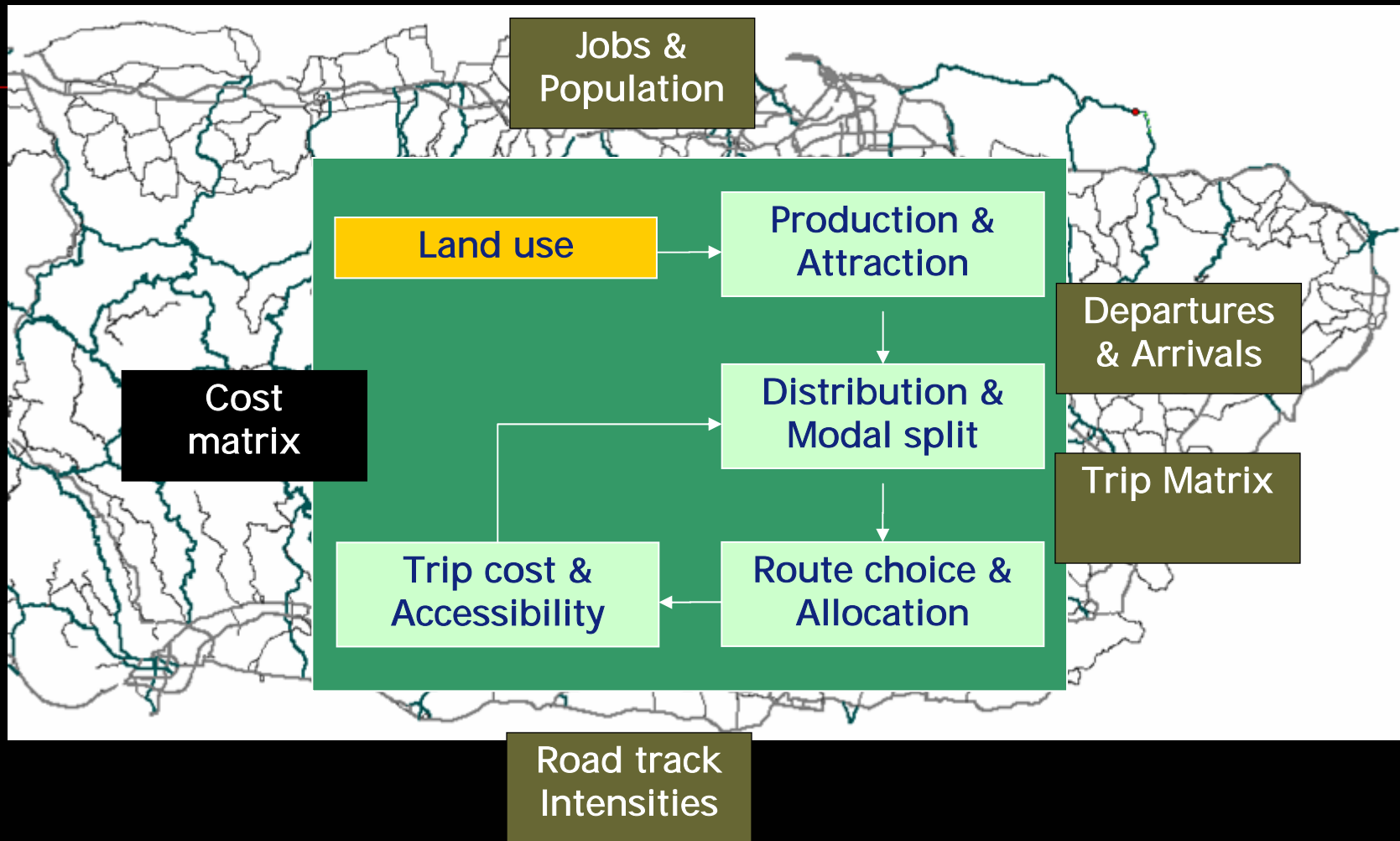
Major Enhancements Linked to Land Use Make Xplorah Unique

- An age-cohort demographic model;
- Macroeconomic model (39 equations)
 - Final Demand and Housing Forecaster
 - Input-output Matrix (92 sectors);
- A 4 stage transportation model;
- Regional models that distribute national aggregates;
- A Cellular Automata Land Use Model acting at the local level

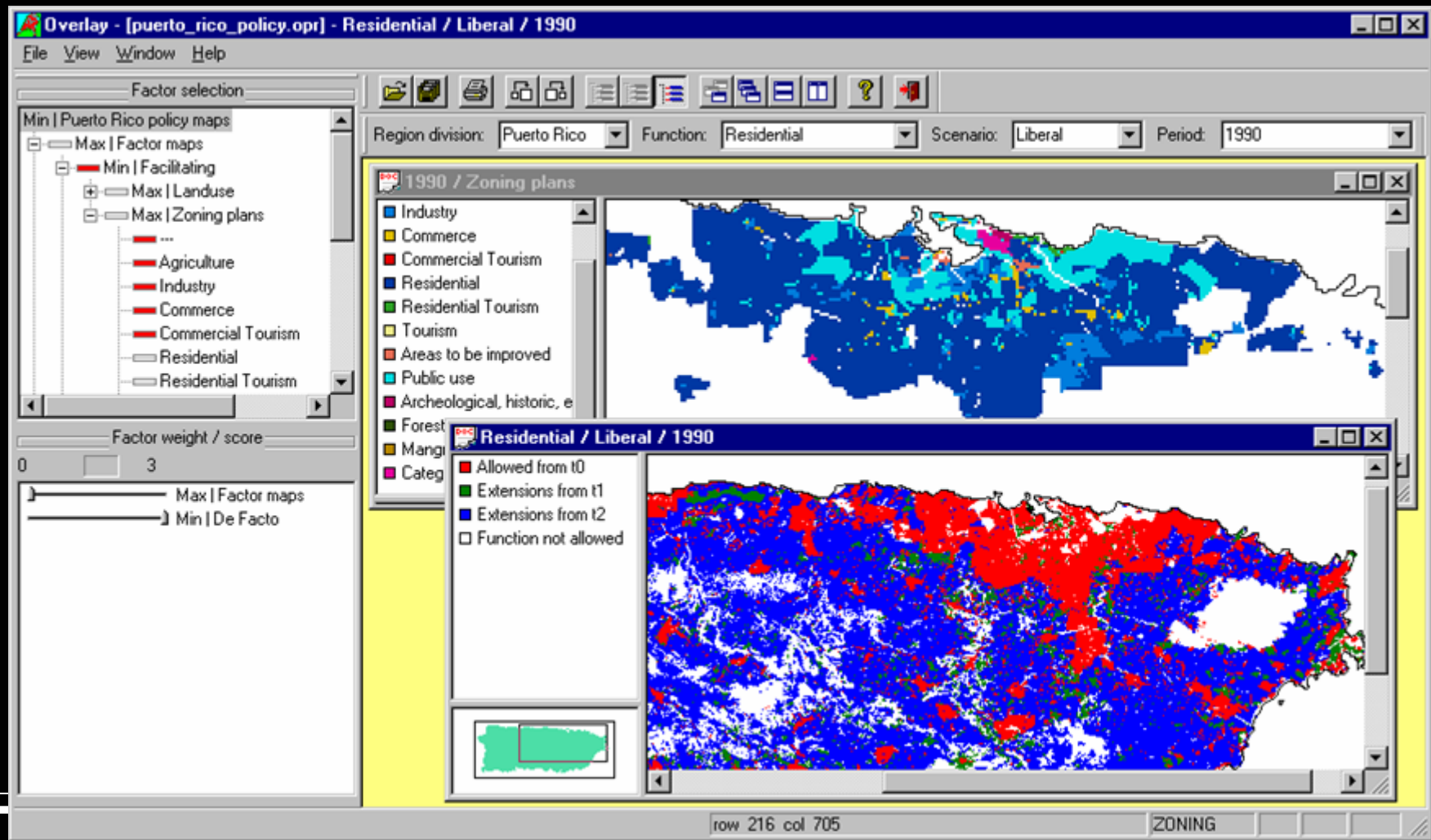
The User Interface Illustrates Processes at 4 Strongly Coupled Spatial Levels



The Four Stage Model

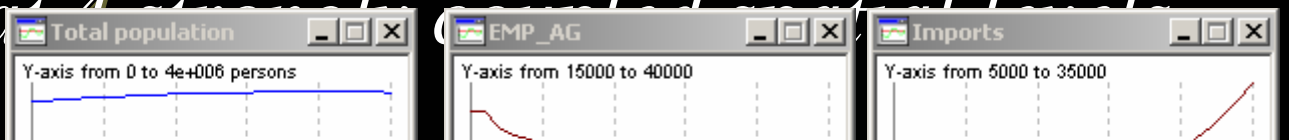


The political dimension is incorporated through: *Suitability & Zoning restriction maps (PUT)*

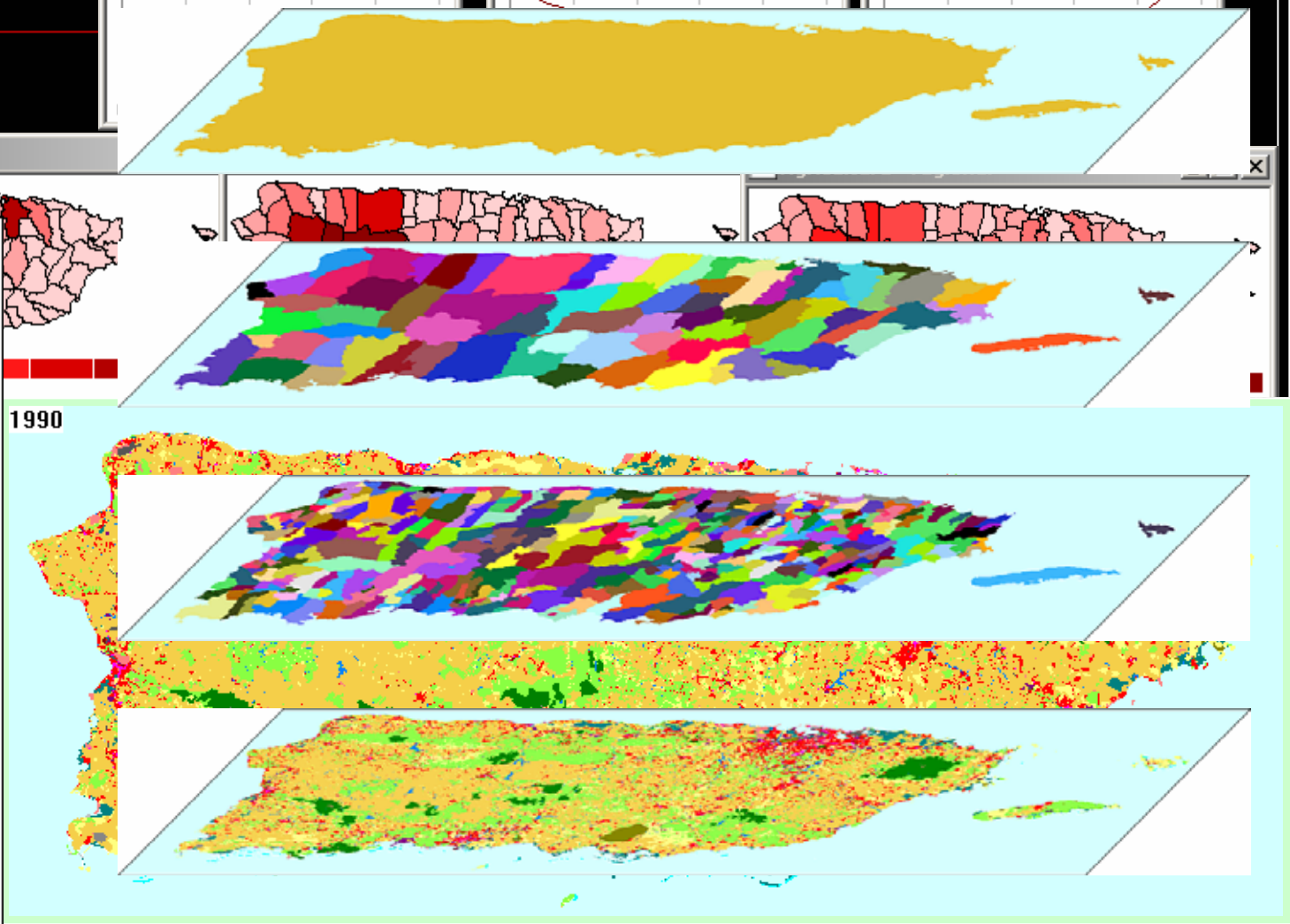


Xplorah: Processes of Development at National Level

National 1 Nation

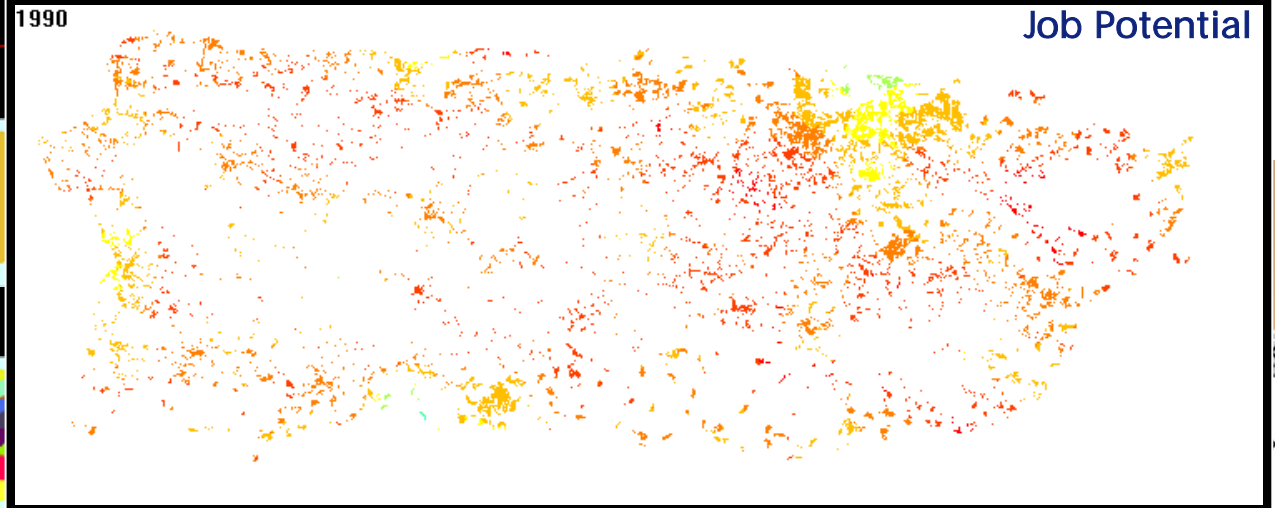


- Population - regional
- Natural
 - Forest
 - Agriculture
 - Construction
 - Mining
 - Industry
 - Trade and services
 - Residential
 - Forest reserve
 - Mangrove and swamps
 - Salt water
 - Beach
 - Coral reef
 - Sweet water
 - Public and recreational uses
 - Utilities
 - Infrastructure
 - Military



Exploring planning options

National Indicators



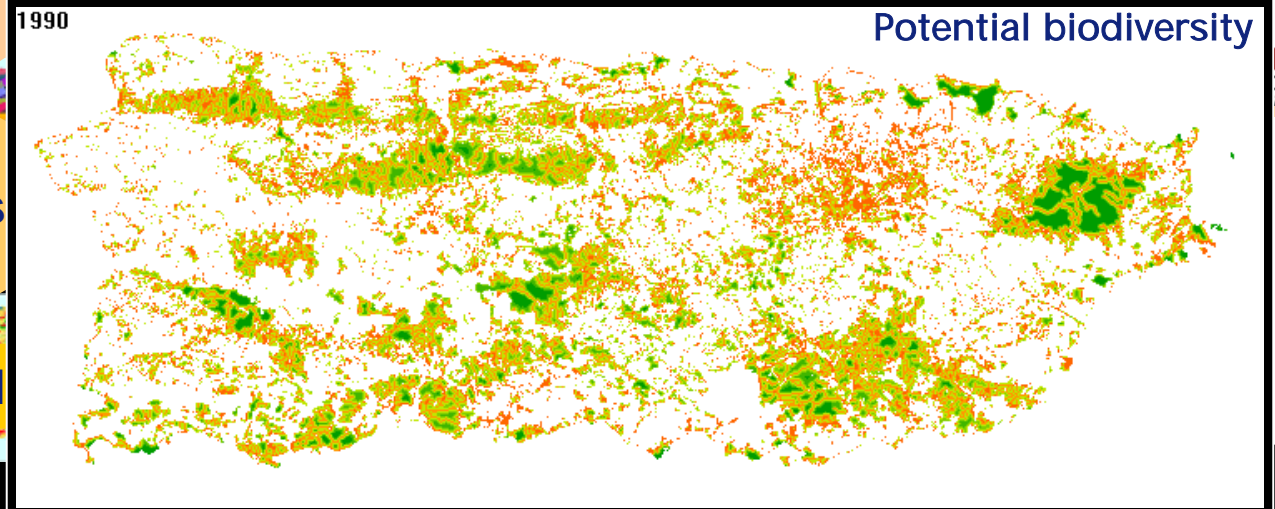
Scenarios

External shocks

Alternative visions

Ex-post, ex-ante trends

Actual and optional pol



The Political Process

- An Intensive effort to obtain acceptance and public funding necessary for development and implementation was launched from the start...
- After a dozen depositions to House and Senate Committees...

First Major Success

- On February 2003, a Joint Resolution, approved unanimously by the House of Representatives and the Senate, was signed into law by then Governor Sila María Calderón to partially fund and support the development of Xplorah.

The Stumbling Rock

- The House and Senate unanimously voted **R.C. de la C. 4666** to extend funding for Xplorah's development, but;
- Separately, order the Puerto Rico Planning Board (PRPB) to prepare a land use plan (PUT) with no funding!
- Xplorah and the PUT became *competing projects!*

Planning system yank

Planners left dumbfounded

Then...the Tragedy

In doubt the future of the most innovative urban planning model in the history of Puerto Rico, Elías Gutiérrez, dean of the Graduate School of Planning at the

elections, had the dean in a cynical mood. Tropimar Beach Club in Isla Verde, while celebrating the 50th anniversary of the Planners Association.

Masstricht and the Research for Information Systems (RIKS) in The Netherlands. Betsy Asencio of the Legal Affairs Office

R.C. de la

is Veto

with since we arrived at the Legislature, and I believe it's the most important [project] in the hands of the Government of Puerto Rico, which is to restructure its planning system," he said then.

The project's early initiatives may be known to mature computer programmers. Basically, Gutiérrez said, Xplorah is the 21st Century model for "The Game of Life," a game of squares played by programmers in the mid to late '70s when micro-processors surfaced.

Today's version has a purpose, as well as 225,000 cells in a 250 by 250 meter map.

"You can, for example, add to the map the proposed routes of the Urban Train to Caguas, or the affect of the construction at Isla Grande on the metropolitan area," he said.

"Everybody is talking about what will happen with Ceiba,

A similar Xplorah model which in part is being implemented by the Evaluations in 500 European cities. In the Mediterranean coast of Spain and agriculture where excessive irrigation exploited and pushed the development of this project.

A legislative economic consultant came more dejected than cynical on Thursday in a cratic and egotistical public environment. "It was a money issue but it also had to do with the Planning Board and other agencies requesting anonymity.

"In this country we still think we think individually and not in macro terms.

There are a couple of agencies who

Editorial

The mystery pocket veto

Now we are confronted with the Mystery of the Great Pocket Veto. Amidst the hullabaloo of the great election controversy, there occurred very quietly Gov. Calderón's pocket veto of a legislative resolution that would, according to an array of planning and development enthusiasts, revolutionize Puerto Rico's planning, thrusting it into the modern era of advanced technology.

Chief proponent of the change, Elías Gutiérrez, dean of the Graduate School of Planning at the University of Puerto Rico, said the resolution would have appropriated final funding for a computerized model designed for use as an analytical planning tool.

The model, named Xplorah, was devised by UPR in conjunction with the University of Masstricht and the Research Institute for Knowledge Systems in The Netherlands. It was stopped short when the governor apparently decided the \$350,000 closing cost was more needed elsewhere.

Betsy Asencio of La Fortaleza's Legal Affairs Office said, "It was a good initiative. The money was available, but it was needed for urgent services that were not expected."

The Legislature had been solidly in back of the project, having provided an initial \$350,000 to go with \$125,000 from UPR, assigned by former president Norman Maldonado.

House Vice President Ferdinand Pérez of the Popular Democratic Party and author of the resolution, said in March that, "This is perhaps the most important thing we've worked with since we arrived at the Legislature, and I believe it's the most important [project] in the hands of the government of Puerto Rico — to restructure its planning system."

Why would something so promising of modernizing Puerto Rico's bureaucratic, dismally inefficient planning system be mothballed for lack of \$350,000?

Calderón does not have to explain reasons for pocket vetoes, but in this instance one is certainly called for.

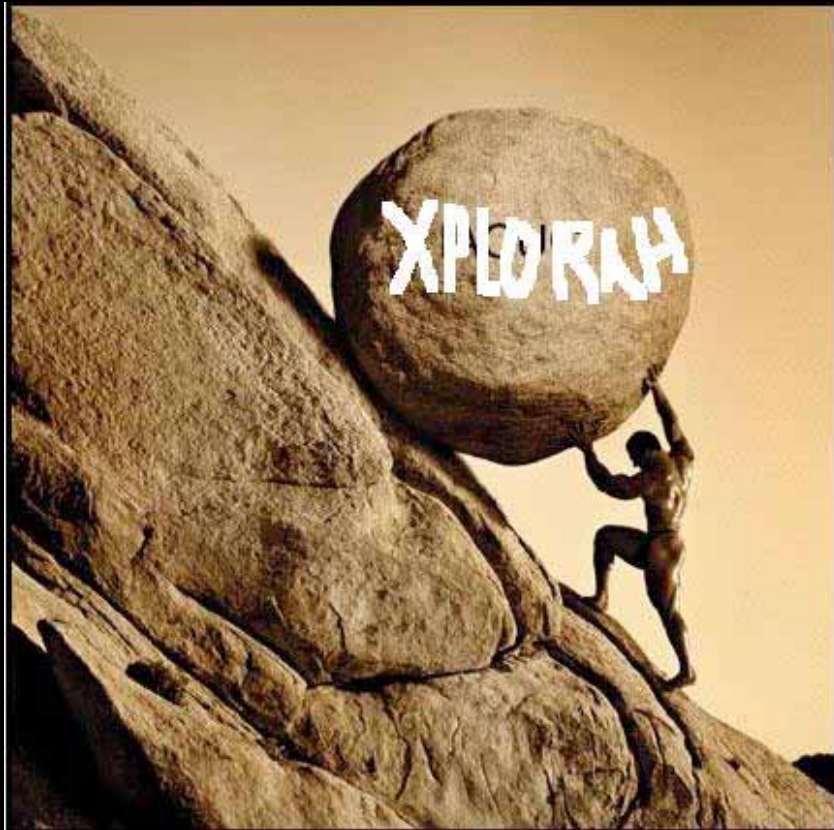
In any event, the new session of the Legislature opening in January should make a review of this situation a priority.

The San Juan Star
El San Juan Star
El Star Extra



El Arecibo Star
El Mayagüez Star
El Ponce Star

So...



**...start
again!**

In the mean time the politics of land use intensified

- The absence and need for an SDSS became clear.
- The technical and political process came to a **boiling point** in 2006 with the publication by the PRPB of a draft of the first land use plan (PUT) ever attempted for the island.

Pandemonium!

- The PUT was found to be based on Inaccurate, outdated and incorrect land use maps;
- The PRPB lacked instruments to evaluate alternatives;
- The likely consequences of plan adoption were unknown;
- The team of planners and technicians that had prepared the plan revolted and were dismissed.

PLAN DE USO DE TERRENOS EN EL LIMBO



Carta
Maywood,
T.A. Shady
(2002)

■ **Despiden al Director
y renuncian los peritos**

Página 12



14/03/07 - Frank Hoffmann

**A technical problem
transformed into a political
time bomb.**

**Need for Xplorah
Gains Political Support!**

**An Updated
Land Use Map
Become a Political
Necessity**

**The Need for Xplorah
Gained Political
Support!**

Enter the The Governor's Advisory Board on Urbanism

*“...to plan, Xplorah is needed,
and Xplorah requires reliable
data...”*



“Puerto Rico needs a plan...”

...but, how can we plan if you don't even know what's on the ground?”

Then, fiscal crisis strikes:

- On May 1st 2006 the government of the Commonwealth of Puerto Rico shuts down for the first time in history after running out of cash to pay the wage bill.



Implementing Xplorah requires
production of adequate land
use maps at affordable cost

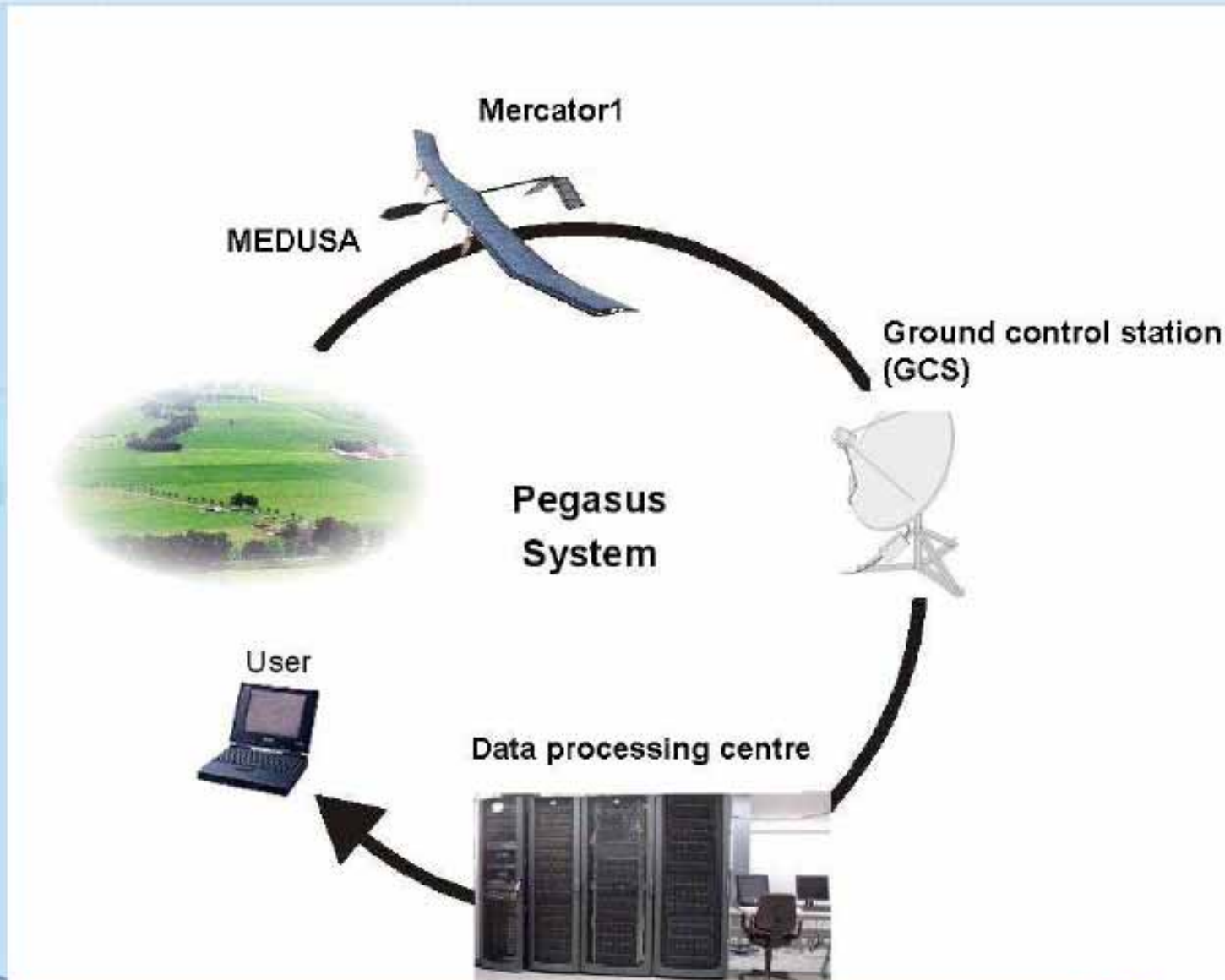
An Unexpected Technological Solution Enters the Arena



Pegasus: UAV-HALE Remote Sensing Platform



Pegasus is a system, not an aircraft



pegasus: the low cost, high precision remote sensing solution

The Inevitable Result...

Victory!

But, wait...

*...Just
not yet!*

There was a joker in the deck!

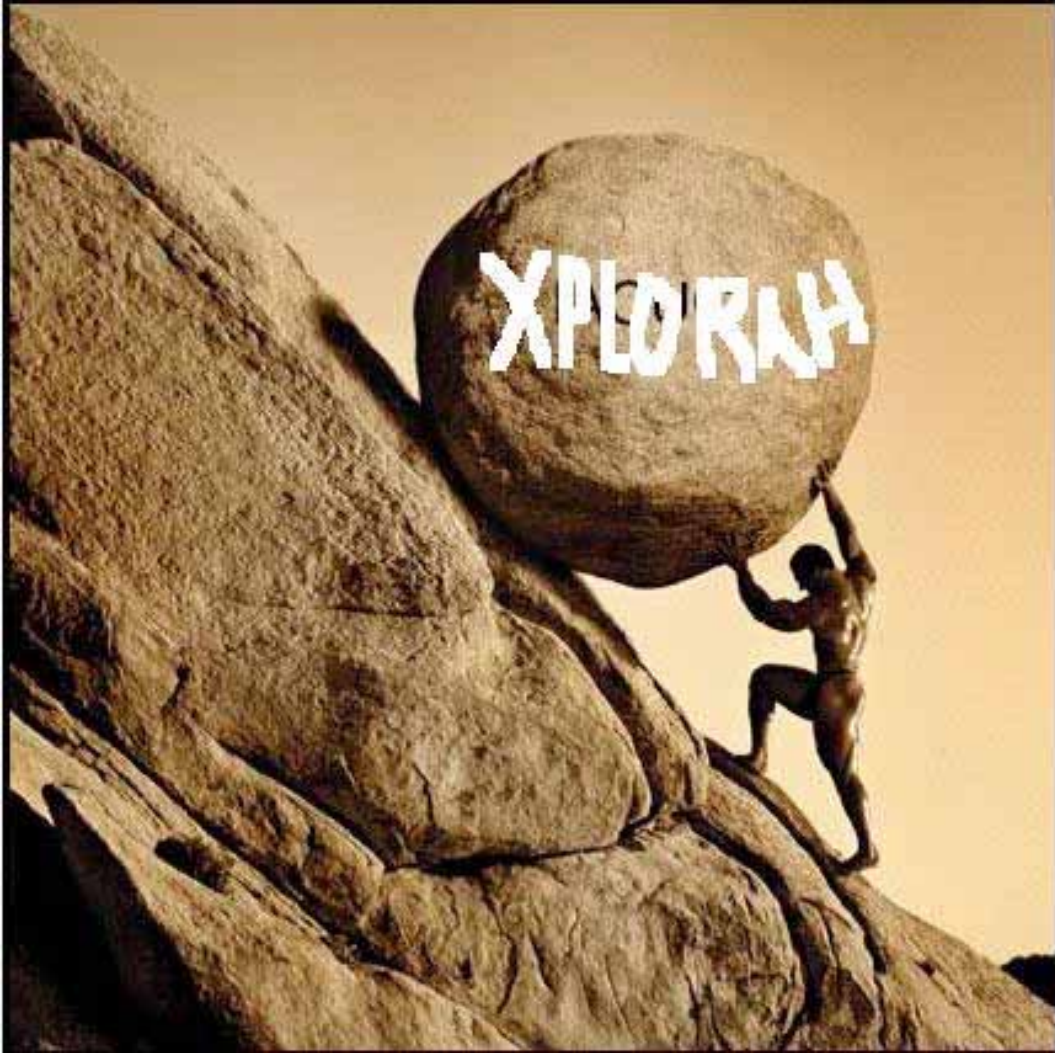


Politics again...

- In December 2006 the New Progressive Party (NPP) that controls the Legislature, blocked a \$500 million GO bond issue that, among other infrastructure projects, would have funded the implementation of Xplorah.
- **The battle was afoot once more!**

Finally...

- In December 2007 the contracts were signed and the project's implementation starting in January 2008 and programmed to extend for 30 months.



**THE
END
?**